

**Navy Advancement Center**

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# **Advancement Handbook for Hull Technician**

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## **PREFACE**

The purpose of the Advancement Handbook is to help you focus your preparation for Navywide advancement-in-rating examinations. The bibliographies (BIBs) together with this handbook form a comprehensive examination study package. Since this handbook provides skill and knowledge components for each paygrade of the HT rating, it helps you concentrate your study on those areas that may be tested. This feature will help you get the most out of your study time.

Each page in Parts 1 through 4 of this Advancement Handbook presents general skill areas, specific skill areas, the knowledge factors associated with each skill area, the pertinent references that address each skill, and the subject areas that may be covered on the examination. The skill statements describe the skills you are expected to perform for each paygrade. The skill statements are cumulative; that is, you are responsible for the skills for the paygrade you are competing for, your present paygrade, and all paygrades below.

Although this handbook is very comprehensive, it cannot cover all the tasks performed in the rating. As a result, the advancement examinations may contain questions more detailed than described in the “*Exam Expectations*” section of the skill areas.

Remember that advancement competition is keen, so your keys to advancement include not only comprehensive advancement examination study but also sustained superior performance.

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**CONTENTS**

PARTS		PAGE
1	Advancement Handbook for HT3.....	1-1
2	Advancement Handbook for HT2.....	2-1
3	Advancement Handbook for HT1.....	3-1
4	Advancement Handbook for HTC.....	4-1
Appendix 1	References Used in This Advancement Handbook	A-1

## Part 1

### Advancement Handbook for HT3

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Plumbing and Piping Systems Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Repair and replace plumbing system fixtures</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify system components and procedures used in the following areas:</p> <ul style="list-style-type: none"> <li>· Repair of fixtures</li> <li>· Safety precautions</li> <li>· Documents containing repair parts</li> <li>· Tools required for repairing components</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• NSTM, Chapter 505, Piping Systems, NAVSEA S9100-AB-GTP-010</li> <li>• Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on gasket material selection, hand tools for working pipe and tubing, safety procedures involved when working with piping systems, and identifying correct repair or replacement parts.

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Plumbing and Piping Systems Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Fabricate/replace gaskets and sealing materials</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify documents, materials, and tools used to fabricate/replace gaskets</li> <li>• Identify documents, materials, and tools used when replacing sealing materials</li> <li>• Identify applicable safety precautions</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• NSTM, Chapter 078, Gaskets, Packing, and Seals, NAVSEA S9086-CM-STM-000</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on identification, selection, precautions, and tools required for replacing gaskets and packing material. You can also expect questions about applicable safety precautions.

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Plumbing and Piping Systems Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Remove, install, and repair insulation and lagging</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify procedures and documents used in the following areas:</p> <ul style="list-style-type: none"> <li>• Taking samples</li> <li>• Asbestos rip out</li> <li>• Thermal, fire, and acoustic insulation</li> <li>• Hazardous material storage and disposal</li> </ul> <p>Recall applicable safety precautions for working with lagging and asbestos</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 635, Thermal, Fire, and Acoustic Insulation, NAVSEA S9086-VH-STN-010</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on asbestos work procedures, lagging and insulation work, and identification of materials to include applicable safety precautions. You can also expect questions on safety, storage, disposal, and reference documents pertaining to insulation and lagging.

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Plumbing and Piping Systems Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Repair and replace piping systems</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify piping system blueprints and schematic diagrams</p> <p>Recall military and commercial specifications and markings</p> <p>Identify the procedures for conducting piping inspections</p> <p>Recall the procedures to follow when making the following determinations:</p> <ul style="list-style-type: none"> <li>• Bend allowance for pipe</li> <li>• Lay out pipe templates</li> <li>• Pipe size</li> </ul> <p>Recall the procedures to follow when taking the following actions:</p> <ul style="list-style-type: none"> <li>• Cut pipe</li> <li>• Target piping</li> <li>• Bend pipe</li> <li>• Inspect pipe after bending</li> <li>• Tread pipe</li> <li>• Flare tubing</li> <li>• Manufacture gauge lines</li> <li>• Manufacture flex hoses</li> <li>• Overhaul resilient sound isolation couplings (RESICs)</li> <li>• Drill, tap, and thread</li> </ul> <p>Recall applicable safety precautions</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Blueprint Reading and Sketching, NAVEDTRA 12014</li> </ul>



	<ul style="list-style-type: none"> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 074, Volume 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM, Chapter 074, Volume 2, Nondestructive Testing of Metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA S9086-CH-STM-020</li> <li>• NSTM, Chapter 074, Volume 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 078, Gaskets, Packing, and Seals, NAVSEA S9086-CM-STM-000</li> <li>• NSTM, Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-0</li> <li>• NSTM, Chapter 583, Boats and Small Craft, NAVSEA S9086-TX-STM-000</li> <li>• NSTM, Chapter 593, Pollution Control, NAVSEA S9086-T8-STM-010</li> <li>• NSTM, Chapter 634, Deck Coverings, NAVSEA S9086-VG-STM-000</li> <li>• NSTM, Chapter 635, Thermal, Fire, and Acoustic Insulation, NAVSEA S9086-VH-STN-010</li> <li>• Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Ship Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Fabrication and Inspection of Brazed Piping Systems, NAVSEA 0900-L9-001-7000</li> <li>• Technical Directive for Piping Devices, Flexible Hose Assemblies, NAVSEA S6430-AE-TED-010</li> <li>• Technical Devices for Piping Devices, Flexible Rubber Insert Sound Isolation</li> </ul>
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	<p>Couplings (RISC), NAVSEA S6430-AE-TED-020</p> <ul style="list-style-type: none"> <li>• Welded Joint Design, MIL-STD-22D</li> </ul>
<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on material identification, cutting, layout, bending, fabrication, repair, threading, and inspection of piping systems, and brackets. You can also expect questions on manufacturing gauge lines, flex hoses, and drilling and tapping procedures to include applicable safety precautions.</p>

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Plumbing and Piping Systems Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Repair and replace valves</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify valves and their components</li> <li>• Identify procedures for repairing and replacing valves</li> <li>• Identify materials on blueprints</li> <li>• Recall military and commercial specifications</li> <li>• Recall military and commercial markings</li> <li>• Recall applicable safety precautions</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Blueprint Reading and Sketching, NAVEDTRA 12014</li> <li>• NSTM, Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-010</li> <li>• Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Fabrication and Inspection of Brazed Piping Systems, NAVSEA 0900-L9-001-7000</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions	You can expect questions on valve types, components, identification markings, and uses. You can also expect questions on repair/replacing valves and their components

correctly:	to include applicable safety precautions.
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## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Plumbing and Piping Systems Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Inspect/test piping, tubing, and valves</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify the procedures used to accomplish the following actions:</p> <ul style="list-style-type: none"> <li>• Inspect/test valves</li> <li>• Repair piping and tubing</li> <li>• Inspect piping and brackets for deterioration</li> <li>• Hydrotest piping systems and components</li> <li>• Inspect/test flex hoses and connections</li> </ul> <p>Recall applicable safety precautions</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 074, Volume 2, Nondestructive Testing of Metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA S9086-CH-STM-020</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-010</li> <li>• Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> </ul>

	<ul style="list-style-type: none"> <li>• Fabrication and Inspection of Brazed Piping Systems, NAVSEA 0900-L9-001-7000</li> <li>• Technical Directive for Piping Devices, Flexible Hose Assemblies, NAVSEA S6430-AE-TED-010</li> <li>• Technical Directive for Piping Devices, Flexible Rubber Insert Sound Isolation Couplings, NAVSEA S6430-AE-TED-020</li> </ul>
<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on inspection and testing procedures for repaired piping, valves, tubing, and flex hose assemblies. You can also expect questions on inspection of pipe brackets.</p>

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Sewage Systems Maintenance and Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Inspect/maintain sewage system components</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify the components, materials, and procedures used to inspect and maintain the following :</p> <ul style="list-style-type: none"> <li>• Sewage system</li> <li>• Sewage pumps</li> <li>• Pumps and valves</li> </ul> <p>Recall comminutor operation Recall applicable safety precautions</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 074, Volume 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 078, Gasket, Packing, and Seals, NAVSEA S9086-CM-STM-000</li> <li>• NSTM, Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-010</li> <li>• NSTM, Chapter 593, Pollution Control, NAVSEA S9086-T8-STM-010</li> <li>• Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> </ul>

<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on inspection and replacement of system parts, maintenance, and safety when working with sewage systems.</p>
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## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Sewage Systems Maintenance and Repair</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Align and test sewage system</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify the terms, procedures, and safety precautions that pertain to the following actions:</p> <ul style="list-style-type: none"> <li>• Align pumps for the proper mode</li> <li>• Test sewage pumps</li> <li>• Cycle diverter valves</li> <li>• Test float sensors</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• NSTM, Chapter 593, Pollution Control, NAVSEA S9086-T8-STM-010</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on modes of operation; testing of float sensors, valve types, and pump operation. You can also expect questions on applicable safety precautions.

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Metal Layout, Fabrication, and Installation</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Lay out metal</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify procedures used in the following areas:</p> <ul style="list-style-type: none"> <li>• Read blueprints, schematic diagrams, and ships drawings</li> <li>• Read tape measure, mikes, feeler gauges, torque wrenches, and so forth</li> <li>• Manufacture templates, sheet metal patterns, and sheet metal layouts</li> <li>• Compute perimeter, area, volume and circumference of various geometric shapes</li> <li>• Compute bend allowance for plate and round stock</li> <li>• Construct metal objects using radial, parallel, and triangulation line development</li> <li>• Lay out the different seams used in sheet metal fabrication.</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Blueprint Reading and Sketching, NAVEDTRA 12014</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 074, Volume 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM, Chapter 074, Volume 2, Nondestructive Testing of Metals, Qualification and Certification</li> </ul>

	<p>Requirements for Naval Personnel</p> <ul style="list-style-type: none"> <li>• NSTM, Chapter 074, Volume 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Ships Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Standard Organization and Regulations of U. S., Navy, OPNAVINST 3120.32</li> <li>• Structural Repairs, NAVSEA S9100-AB-GTP-010</li> </ul>
<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on blueprints and schematic diagrams; measuring tools; templates, sheet metal layout using radial, parallel, and triangulation development; bend allowances; and how to compute perimeter, area, volume, and circumference of various geometric shapes.</p>

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Metal Layout, Fabrication, and Installation</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Fabricate and install sheet metal and structural forms and fixtures</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify procedures, materials, and tools used to accomplish the following actions to include applicable safety precautions:</p> <ul style="list-style-type: none"> <li>• Fabricate and repair deck plates, closure plate patches, coffer dams, stanchions, brackets, structural fixtures, vent ducts, sheet metal fixtures and components</li> <li>• Set up and operate forming equipment such as the brake press, slip roll, universal ironworker, pullmax, and so forth.</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Blueprint Reading and Sketching, NAVEDTRA 12014</li> <li>• NSTM, Chapter 074, Volume 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM, Chapter 074, Volume 2, Nondestructive Testing of Metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA S9086-CH-STM-020</li> <li>• NSTM, Chapter 074, Volume 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 078, Gaskets, Packing, and Seals</li> </ul>

	<ul style="list-style-type: none"> <li>• NSTM, Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-010</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Structural Repairs NAVSEA S9100-AB-GTP-010</li> <li>• Fabrication and Inspection of Brazed Piping Systems, NAVSEA 0900-L9-001-7000</li> <li>• Technical Directive for Piping Devices, Flexible Hose Assemblies, NAVSEA S6430-AE-TED-010</li> <li>• Welded Joint Design, MIL-STD-22D</li> </ul>
<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on fabrication and installation of vent ducts, sheet metal bulkheads, coffer dams, closure plate patches, forming tools and equipment, and seam and joint construction and design. You can also expect questions about applicable safety precautions</p>

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Wood, Insulation and Fiberglass, Layout, Fabrication, and Installation</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Manufacture wooden products</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify procedures used to manufacture the following items:</p> <ul style="list-style-type: none"> <li>• Boat beading</li> <li>• Wooden products</li> <li>• Wooden coffer dams</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on wood classifications, joints, fasteners, and fabrication.

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Wood, Insulation and Fiberglass, Layout, fabrication, and Installation</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Use insulating materials</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify insulating materials</li> <li>• Identify procedures for the use, storage, and disposal of insulating materials used in bulkheads, overheads, and vent ducts</li> <li>• Recall the procedures for taking samples</li> <li>• Recall the procedures for accomplishing asbestos rip out</li> <li>• Identify hazardous material</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 635, Thermal, Fire, and Acoustic Insulation, NAVSEA S9086-VH-STM-010</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on asbestos work procedures, lagging and insulation work, and identification of materials. You can also expect questions on safety, storage, disposal, and reference documents.

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Wood, Insulation, and Fiberglass</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Repair fiberglass</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify materials and tools used for glass reinforced plastic repair</li> <li>• Recall applicable safety precautions</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 583, Boats and Small Craft, NAVSEA S9086-TX-STM-000</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions about materials, tools, procedures, and safety precautions to follow when working with fiberglass. You can also expect questions about working with hazardous materials.



## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Cutting and Welding</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Cut metals and alloys</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify equipment and procedures used to perform the following actions:</p> <ul style="list-style-type: none"> <li>• Inspect and replace zinc's</li> <li>• Inspect and set up cutting systems</li> <li>• Cut pipe and plate</li> </ul> <p>Recall applicable safety precautions</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 074, Volume 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM, Chapter 074, Volume 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Structural Repairs, NAVSEA S9100-AB-GTP-010</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions	You can expect questions on cutting equipment, such as saws, shears, oxyacetylene torches and plasma arc to include applicable safety precautions. You can also expect

correctly:	questions on layout and cutting blank flanges and deck plates. You can also expect questions on the stowage and inspection of compressed gas cylinders to include applicable safety precautions.
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## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Cutting and Welding</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Perform welding operations</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify systems and procedures for the following welding operations:</p> <ul style="list-style-type: none"> <li>• Set up equipment</li> <li>• Prepare surfaces</li> <li>• Check fit up for welding</li> <li>• Preheat, post-heat, and stress relieve metals</li> <li>• Harden metals</li> <li>• Clean welds and castings</li> <li>• Conduct nondestructive tests</li> <li>• Repair structural damage and patch aluminum hulls</li> <li>• Surface materials and deck coverings</li> </ul> <p>Recall applicable safety precautions</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 074, Volume 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM, Chapter 074, Volume 2, Nondestructive Testing of Metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA S9086-CH-STM-020</li> <li>• NSTM, Chapter 074, Volume 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> </ul>

	<ul style="list-style-type: none"> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• Ship Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Structural Repairs, NAVSEA S9100-AB-GTP-010</li> <li>• Welded Joint Design, MIL-STD-22D</li> <li>• NSTM, Chapter 634, Deck Coverings, NAVSEA S9086-VG-STM-000</li> </ul>
<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on joint design and fit-ups, set up and operation of welding machines, inspection and stowage of welding electrodes, preheat, post-heat, and stress relieving procedures, and nondestructive tests. You can also expect questions on safety procedures and equipment.</p>

## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Brazing</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Braze weld and silver brazing metals</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify processes and procedures for the following operations:</p> <ul style="list-style-type: none"> <li>• Braze weld metals</li> <li>• Silver braze metals</li> </ul> <p>Recall applicable safety precautions.</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 074, Volume 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM, Chapter 074, Volume 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• Ship Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Fabrication and Inspection of Brazed Piping Systems, NAVSEA 0900-L9-001-7000</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on procedures for braze welding, silver brazing, fit-up, and cleaning. You can also expect questions on brazing alloys and safety.



## Advancement Handbook for HT3

General HT3 <i>Skill Area</i>	<b>Tools and Equipment Maintenance and Repair</b>
<i>A skill</i> you are expected to perform from the General Skill Area above:	<b>Maintain and repair shop tools and equipment</b>
<i>Knowledge</i> you should have to perform this skill:	Identify equipment and procedures used when performing the following actions: <ul style="list-style-type: none"> <li>• Sharpening tools</li> <li>• Dress grinding wheels</li> <li>• Changing cutting edges on power shears</li> <li>• Replacing saw blades, belts, bits, and disks</li> <li>• Setting up welding equipment</li> </ul> Recall applicable safety precautions
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual, OPNAVINST 5100.19</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the maintenance of hand tools such as sharpening, dressing wheels, changing cutting edges, bits, disks, and replacing blades. You can also expect questions on setup of shop equipment such as welding, wood working and metal forming machinery to include applicable safety precautions.

## Part 2

### Advancement Handbook for HT2



## Advancement Handbook for HT2

General HT2 <i>Skill Area</i>	<b>WOOLD, INSULATION AND FIBERGLASS, LAYOUT, FABRICATION, AND INSTALLATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Monitor asbestos rip-outs</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify processes and procedures for monitoring asbestos rip-out.</li> <li>• Identify safety precautions.</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Engineering Administration, 12147</li> <li>• NSTM, Chapter 074, Vol 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-000</li> <li>• NSTM, Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM, Chapter 635, Thermal, Fire, and Acoustic Insulation, NAVSEA S9086-VH-STN-010</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on asbestos work procedures and monitoring rip-out teams. You can also expect questions about applicable safety precautions

## Advancement Handbook for HT2

General HT2 Skill Area	<b>CUTTING AND WELDING</b>
A skill you are expected to perform from the General Skill Area above:	<b>Conduct spark and acid test to identify metals</b>
Knowledge you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify the procedures used to identify metals when conducting a spark test</li> <li>• Identify the procedures used to identify metals when conducting an acid test</li> <li>• Identify safety precautions.</li> </ul>
References you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• NSTM Chapter 074, Vol. 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM Chapter 074, Vol. 2, Nondestructive Testing of metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA S9086-CH-STM-020</li> <li>• NSTM Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> </ul>
Exam Expectations. These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the identification of metals by using the spark test and the acid test. You can also expect questions on applicable safety precautions.

## Advancement Handbook for HT2

General HT2 <i>Skill Area</i>	<b>CUTTING AND WELDING</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Weld repair valves</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify valve components</li> <li>• Recall welding equipment setup</li> <li>• Identify repair procedures</li> <li>• Recall applicable safety precautions</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Engineering Administration, 12147</li> <li>• NSTM Chapter 074, Vol. 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM Chapter 074, Vol. 2 Nondestructive Testing of metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA S9086-CH-STM-020</li> <li>• NSTM Chapter 074, Vol. 3 Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-SLTM-000</li> <li>• Ship Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> <li>• Structural Repairs, NAVSEA S9100-AB-GTP-010</li> <li>• Weld Joint Design, MIL-STD-22D</li> </ul>

<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on welding equipment, valve materials and components, welding procedures, and applicable safety precautions.
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## Advancement Handbook for HT2

General HT2 <i>Skill Area</i>	<b>CUTTING AND WELDING</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Perform inspections required for hot work</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify procedures used in inspections</li> <li>• Identify documents containing inspection guidelines</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Engineering Administration, 12147</li> <li>• NSTM Chapter 074, Vol. 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM Chapter 074, Vol. 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM Chapter 077 Personnel Protection Equipment, NAVSEA S9086-CL-SLTM-000</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on inspection procedures, safety, fire watches, testing equipment, and gas free engineering.

## Advancement Handbook for HT2

General HT2 <i>Skill Area</i>	<b>CUTTING AND WELDING</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Identify metals, piping and components</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify metal forms and shapes</li> <li>• Identify piping, tubing, and fittings</li> <li>• Identify alloys</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• NSTM Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-000</li> <li>• Ship Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Technical Directive for Piping Devices, Flexible Hose Assemblies, NAVSEA S6430-AE-TED-010</li> <li>• Technical Directive for Piping Devices, Flexible Rubber Insert Sound Isolation Couplings (RISIC), NAVSEA S6430-AE-TED-020</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on the identification of piping, tubing, metal shapes and forms. You can also expect questions on alloy identification.

## Advancement Handbook for HT2

General HT2 <i>Skill Area</i>	<b>CUTTING AND WELDING</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Repair boats</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify procedures, materials, and equipment used for the following actions areas:</p> <ul style="list-style-type: none"> <li>• Manufacture boat beading and other wooden products</li> <li>• Cut and repair fiberglass and plastics</li> <li>• Patch aluminum boat hulls</li> </ul> <p>Identify safety precautions.</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Engineering Administration, 12147</li> <li>• NSTM Chapter 074, Vol. 1, Welding and Allied Processes, NAVSEA NSTM S9086-CH-STM-010</li> <li>• NSTM Chapter 074, Vol. 2, Nondestructive Testing of metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA NSTM S9086-CH-STM-0210</li> <li>• NSTM Chapter 074, Vol. 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-STM-000</li> <li>• NSTM Chapter 583, Boats and Small Craft, NAVSEA S9086-TX-STM-000</li> <li>• Ship Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Standard Organization and Regulations of</li> </ul>

	<p>the U.S. Navy, OPNAVINST 3120.32</p> <ul style="list-style-type: none"> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> <li>• Structural Repairs, NAVSEA S9100-AB-GTP-010</li> <li>• Weld Joint Design, MIL-STD-22D</li> </ul>
<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on repair of boats made of wood, metal, and aluminum. You can also expect questions on tools, equipment, and applicable safety precautions.</p>



## Advancement Handbook for HT2

General HT2 <i>Skill Area</i>	<b>TECHNICAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Draw piping diagrams</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify the parts of a blueprint</li> <li>• Identify symbols and markings used in piping diagrams</li> <li>• Recognize line characteristics found on blueprints and diagrams</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Blueprint Reading and Sketching, 12014</li> <li>• NSTM Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-000</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on development of blueprints, blocks, symbols, markings, and line characteristics.

## Part 3

### Advancement Handbook for HT1

## Advancement Handbook for HT1

General HT1 Skill Area	<b>CUTTING AND WELDING</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Review and supervise welder/brazer qualifications</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify documents used to set welder/brazer qualifications</li> <li>• Recognize welder/brazer qualifications.</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• NSTM Chapter 074, Vol 1, Welding and Allied Processes, NAVSEA NSTM S9086-CH-STM-010</li> <li>• NSTM Chapter 074, Vol 2, Nondestructive Testing of metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA NSTM S9086-CH-STM-020</li> <li>• NSTM Chapter 077, Personnel Protection Equipment,</li> <li>• NSTM Chapter 505, Piping Systems, NAVSEA S9086-RKK-STM-000</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> <li>• Fabrication and Inspection of Brazed Piping Systems, NAVSEA 0900-LP-001-7000</li> <li>• Weld Joint Design, MIL-STD-22D</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you	You can expect questions on procedures, documents, and upkeep of welding and brazing qualifications.

answer exam questions correctly:	
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## Advancement Handbook for HT1

General HT1 <i>Skill Area</i>	<b>TECHNICAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Update calibration records</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify documents used to update calibration records</li> <li>• Identify procedures used to update calibration records</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• Metrology Automated System for Uniform Recall and Reporting(MEASURE), OPNAV 0P43P6B</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on documents and procedures for maintaining calibration records.

## Advancement Handbook for HT1

General HT1 <i>Skill Area</i>	<b>TECHNICAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Verify the accuracy of ships drawings</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify ships drawings</li> <li>• Recall procedures to identify ship specifications</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Blueprint Reading and Sketching, NAVEDTRA 12014</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• General Specifications For Ships Of The United States Navy, NAVSEA S9AA0-AA-SPN-010/GEN-SPEC</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on verification of accuracy of ships drawings.

## Advancement Handbook for HT1

General HT1 <i>Skill Area</i>	<b>TECHNICAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Write controlled work procedures</b>
<i>Knowledge</i> you should have to perform this skill:	<p>Identify controlled work procedures for the following actions:</p> <ul style="list-style-type: none"> <li>• Repairing structures</li> <li>• Repairing piping systems</li> <li>• Repairing equipment</li> </ul> <p>Recall quality assurance (QA) structure</p>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Blueprint Reading and Sketching, NAVEDTRA 12014</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• Quality Maintenance (QA) Manual, Joint Forces Maintenance Manual (JFMM) CINCLANTFLTINST/CINCPACFLTINST 4790.3, VOL.5</li> <li>• General Specifications For Ships Of The United States Navy, NAVSEA S9AA0-AA-SPN-010/GEN-SPEC</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on levels of control, planning, and estimating and QA structure and organization.

## Part 4

### Advancement Handbook for HTC



## Advancement Handbook for HTC

General HTC <i>Skill Area</i>	<b>TECHNICAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Review controlled repair procedures</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify documents/publications used for repair procedures</li> <li>• Recall applicable safety</li> <li>• Identify technical references</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• NSTM Chapter 074, Vol. 1, Welding and Allied Processes, NAVSEA S9086-CH-STM-010</li> <li>• NSTM Chapter 074, Vol. 2, Nondestructive Testing of metals, Qualification and Certification Requirements for Naval Personnel, NAVSEA S9086-CH-STM-020</li> <li>• NSTM Chapter 074, Vol. 3, Gas Free Engineering, NAVSEA S9086-CH-STM-030</li> <li>• NSTM Chapter 077, Personnel Protection Equipment, NAVSEA S9086-CL-LSTM-000</li> <li>• NSTM Chapter 078, Gaskets, Packing, and Seals, S9086-CM-STM-000</li> <li>• NSTM Chapter 505, Piping Systems, NAVSEA S9086-RK-STM-000</li> <li>• NSTM Chapter 583, Boats and Small Craft, NAVSEA S9086-TX-STM-000</li> <li>• NSTM Chapter 593, Pollution Control, NAVSEA S9086-T8-STM-010</li> <li>• NSTM Chapter 634, Deck Coverings, NAVSEA S9086-VG-STM-000</li> <li>• NSTM Chapter 635, Thermal, Fire, and Acoustic Insulation, NAVSEA S9086-VH-STN-010</li> </ul>

	<ul style="list-style-type: none"> <li>• Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>• Ship Metallic Material Comparison and Use Guide, NAVSHIPS 0900-038-8010</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> <li>• Structural Repairs, NAVSEA S9100-AB-GTP-010</li> <li>• Fabrication and Inspection of Brazed Piping Systems, NAVSEA 0900-LP-001-7000</li> <li>• Technical Directive for Piping Devices, Flexible Hose Assemblies, NAVSEA S6430-AE-TED-010</li> <li>• Technical Directive for Piping Devices, Flexible Rubber Insert Sound Isolation Couplings (RISIC), NAVSEA S6430-AE-TED-020</li> <li>• Weld Joint Design, MIL-STD-22D</li> <li>• Metrology Automated System for Uniform Recall and Reporting (Measure) OPNAV 0P43P6B</li> <li>• Quality Maintenance (QA Manual) Joint Forces Maintenance Manual (JFMM) CINCLANTFLTINST/CINCPACFLTINST 4790.3, VOL.5</li> <li>• General Specifications For Ships Of The United States Navy, NAVSEA S9AA0-AA-SPN-010/GEN-SPEC</li> <li>• A Guide For The Selection And Use Of Aluminum Alloys For Structure Of Ships Of The United States Navy, NAVSEA 0900-LP-029-9010</li> </ul>
<p><i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:</p>	<p>You can expect questions on documents used to review controlled work procedures, to include QA manuals, safety standards, and technical references.</p>



## Advancement Handbook for HTC

General HTC <i>Skill Area</i>	<b>TECHNICAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Conduct quality assurance audits</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>Identify documents and procedures for conducting QA audits</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>Hull Maintenance Technician, NAVEDTRA 12219</li> <li>Engineering Administration, NAVEDTRA 12147</li> <li>Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> <li>Quality Maintenance (QA Manual) Joint Forces Maintenance Manual (JFMM) CINCLANTFLTINST/CINCPACFLTINST 4790.3, Vol.5</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on procedures and documents used for QA audits.

## Advancement Handbook for HTC

General HTC <i>Skill Area</i>	<b>TECHNECIAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Supervise Operations</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>Identify procedures and processes used to supervise the operation, maintenance, and repair of shipboard hulls and structures, piping systems, and associated repair equipment and components</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>Hull Maintenance Technician, NAVEDTRA 12219</li> <li>Engineering Administration, NAVEDTRA 12147</li> <li>Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> <li>Quality Maintenance (QA Manual) Joint Forces Maintenance Manual (JFMM) CINCLANTFLTINST/CINCPACFLTINST4 790.3, Vol.5</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on manuals, documents, and processes used in the supervision of a work center.

## Advancement Handbook for HTC

General HTC <i>Skill Area</i>	<b>TECHNECIAL ADMINISTRATION</b>
A <i>skill</i> you are expected to perform from the General Skill Area above:	<b>Perform tag-out audits</b>
<i>Knowledge</i> you should have to perform this skill:	<ul style="list-style-type: none"> <li>• Identify documents and procedures used to perform tag-out audits</li> </ul>
<i>References</i> you should study to gain the knowledge you need to perform this skill:	<ul style="list-style-type: none"> <li>• Hull Maintenance Technician, NAVEDTRA 12219</li> <li>• Use and Care of Hand Tools and Measuring Tools, NAVEDTRA 12085</li> <li>• Blueprint Reading and Sketching, NAVEDTRA 12014</li> <li>• Engineering Administration, NAVEDTRA 12147</li> <li>• Ships' Maintenance and Material Management (3-M) Manual, OPNAVINST 4790.4</li> <li>• Standard Organization and Regulations of the U.S. Navy, OPNAVINST 3120.32</li> <li>• Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat, OPNAVINST 5100.19</li> <li>• Quality Maintenance (QA Manual) Joint Forces Maintenance Manual (JFMM) CINCLANTFLTINST/CINCPACFLTINST4 790.3, Vol.5</li> </ul>
<i>Exam Expectations.</i> These are subject areas you should know to help you answer exam questions correctly:	You can expect questions on documents and procedures used to perform tag-out audits.

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## Appendix 1

### References Used in This Advancement Handbook

Rating	Short Title	Long Title	Chapters/ Paragraphs	Stocking Point
<b>HT3</b>	NAVEDTRA 12219	Hull Maintenance Technician		Note 1
	NAVEDTRA 12085	Use and Care of Hand Tools and Measuring Tools		Note 1
	NAVEDTRA 12014	Blueprint Reading and Sketching		Note 1
	NAVEDTRA 12147	Engineering Administration		Note 1
	OPNAVINST 5100.19	Navy Occupational Safety and Health (NAVOSH) Program Manual		Note 2
	OPNAVINST 4790.4	Ships' Maintenance and Material Management (3-M) Manual		Note 2
	OPNAVINST 3120.32	Standard Organization and Regulations of the U.S. Navy		Note 2
	NSTM, NAVSEA S9086-CH-STM-010	Welding and Allied Processes	Chapter 074, Vol. 1	Note 1
	NSTM, NAVSEA S9086-CH-STM-020	Nondestructive Testing of Metals, Qualification and Certification Requirements for Naval Personnel	Chapter 074, Vol. 2	Note 1
	NSTM, NAVSEA S9086-CH-STM-030	Gas Free Engineering	Chapter 074, Vol. 3	Note 1
	NSTM, NAVSEA S9086-CL-STM-010	Personnel Protection Equipment	Chapter 077	Note 1
	NSTM, NAVSEA S9086-CM-STM-010	Gaskets, Packing, and Seals,	Chapter 078	Note 1
	NSTM, NAVSEA S9100-AB-GTP-010	Piping Systems	Chapter 505	Note 1
	NSTM, NAVSEA S9086-TX-STM-010	Boats and Small Craft	Chapter 583	Note 1
	NSTM, NAVSEA S9086-T8-STM-010	Pollution Control	Chapter 593	Note 1
	NSTM, NAVSEA S9086-VG-STM-010	Deck Coverings	Chapter 634	Note 1
	NSTM, NAVSEA S9086-VH-STN-010	Thermal, Fire, and Acoustic Insulation	Chapter 635	Note 1
	NAVSEA 0900-L9-001-7000	Fabrication and Inspection of Brazed Piping Systems		Note 1
	NAVSEA S6430-AE-TED-010	Technical Directive for Piping Devices, Flexible Hose Assemblies		Note 1
	NAVSEA S6430-AE-TED-020	Technical Directive for Piping Devices, Flexible Rubber Insert Sound Isolation Couplings (RISC)		Note 1



	MIL-STD-22D	Welded Joint Design,		Note 3
	NAVSEA S6430-AE-TED-010	Technical Directive for Piping Devices, Flexible Hose Assemblies		Note 1
	NAVSEA S9100-AB-GTP-010	Structural Repairs,		Note 1
	NAVSEA 0900-L9-001-7000	Fabrication and Inspection of Brazed Piping Systems		Note 1
	NAVSHIPS 0900-038-8010	Ship Metallic Material Comparison and Use Guide		Note 1
<b>HT2</b>	NAVEDTRA 12219	Hull Maintenance Technician		Note 1
	NAVEDTRA 12147	Engineering Administration		Note 1
	OPNAVINST 3120.32	Standard Organization and Regulations of the U.S. Navy		Note 2
	OPNAVINST 5100.19	Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat		Note 2
	NSTM, NAVSEA S9086-CH-STM-010	Welding and Allied Processes	Chapter 074, Vol. 1	Note 1
	NSTM, NAVSEA S9086-CH-STM-020	Nondestructive Testing of Metals, Qualification and Certification Requirements for Naval Personnel	Chapter 074, Vol. 2	Note 1
	NSTM, NAVSEA S9086-CH-STM-030	Gas Free Engineering	Chapter 074, Vol. 3	Note 1
	NSTM, NAVSEA S9086-CL-STM-010	Personnel Protection Equipment	Chapter 077	Note 1
	NSTM, NAVSEA S9086-RK-STM-010	Piping Systems	Chapter 505	Note 1
	NSTM, NAVSEA S9086-TX-STM-010	Boats and Small Craft	Chapter 583	Note 1
	NSTM, NAVSEA S9086-VH-STM-010	Thermal, Fire, and Acoustic Insulation	Chapter 635	Note 1
	NAVSEA S9100-AB-GTP-010	Structural Repairs		Note 1
	NAVSEA S6430-AE-TED-010	Technical Directive for Piping Devices, Flexible Hose Assemblies		Note 1
	NAVSEA S6430-AE-TED-020	Technical Directive for Piping Devices, Flexible Rubber Insert Sound Isolation Couplings (RISIC)		Note 1
	NAVSHIPS 0900-038-8010	Ship Metallic Material Comparison and Use Guide		Note 1
	MIL-STD-22D	Weld Joint Design,		Note 3
<b>HT1</b>	NAVEDTRA 12219	Hull Maintenance Technician		Note 1
	NAVEDTRA 12085	Use and Care of Hand Tools and Measuring Tools		Note 1
	NAVEDTRA 12147	Engineering Administration		Note 1
	OPNAVINST 3120.32	Standard Organization and Regulations of the U.S. Navy		Note 2

	OPNAVINST 5100.19	Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat		Note 2
	OPNAV 0P43P6B	Metrology Automated System for Uniform Recall and Reporting (MEASURE)		Note 2
	NSTM, NAVSEA S9086-CH-STM-010	Welding and Allied Processes	Chapter 074, Vol. 1	Note 1
	NSTM, NAVSEA S9086-CH-STM-020	Nondestructive Testing of metals, Qualification and Certification Requirements for Naval Personnel	Chapter 074, Vol. 2	Note 1
	NSTM, NAVSEA S9086-CL-STM-010	Personnel Protection Equipment	Chapter 077	Note 1
	NSTM, NAVSEA S9086-RK-STM-010	Piping Systems	Chapter 505	Note 1
	NAVSEA 0900-LP-001-7000	Fabrication and Inspection of Brazed Piping Systems		Note 1
	NAVSEA S9AA0-AA-SPN-010/GEN-SPEC	General Specifications For Ships Of The United States Navy		Note 1
	NAVSEA S9AA0-AA-SPN-010/GEN-SPEC	General Specifications For Ships Of The United States Navy	Chapter 074, Vol. 1	Note 1
	CINCLANTFLTINST/CINCPAC FLTINST 4790.3,	Quality Maintenance (QA) Manual, Joint Forces Maintenance Manual (JFMM)	VOL.5	Note 4
	MIL-STD-22D	Weld Joint Design		Note 3
<b>HTC</b>	NAVEDTRA 12219	Hull Maintenance Technician		Note 1
	NAVEDTRA 12085	Use and Care of Hand Tools and Measuring Tools		Note 1
	NAVEDTRA 12014	Blueprint Reading and Sketching		Note 1
	NAVEDTRA 12147	Engineering Administration		Note 1
	OPNAVINST 4790.4	Ships' Maintenance and Material Management (3-M) Manual		Note 2
	OPNAVINST 3120.32	Standard Organization and Regulations of the U.S. Navy		Note 2
	OPNAVINST 5100.19	Navy Occupational Safety and Health (NAVOSH) Program Manual for Forces Afloat		Note 2
	OPNAV 0P43P6B	Metrology Automated System for Uniform Recall and Reporting (MEASURE)		Note 2
	NSTM, NAVSEA S9086-CH-STM-010	Welding and Allied Processes	Chapter 074 Vol. 1	Note 1
	NSTM, NAVSEA S9086-CH-STM-020	Nondestructive Testing of metals, Qualification and Certification Requirements for Naval Personnel	Chapter 074, Vol. 2	Note 1
	NSTM, NAVSEA S9086-CH-STM-030	Gas Free Engineering	Chapter 074, Vol. 3	Note 1
	NSTM, NAVSEA S9086-CM-STM-010	Gaskets, Packing, and Seals	Chapter 077	Note 1

	NSTM, NAVSEA S9086-RK-STM-010	Piping Systems	Chapter 505	Note 1
	NSTM, NAVSEA S9086-TX-STM-010	Boats and Small Craft	Chapter 583	Note 1
	NSTM, NAVSEA S9086-T8-STM-010	Pollution Control	Chapter 593	Note 1
	NSTM, NAVSEA S9086-VG-STM-010	Deck Coverings	Chapter 634	Note 1
	NSTM, NAVSEA S9086-VH-STM-010	Thermal, Fire, and Acoustic Insulation	Chapter 635	Note 1
	NSTM, NAVSEA S9086-CL-STM-010	Personnel Protection Equipment		Note 1
	NAVSEA S9100-AB-GTP-010	Structural Repairs		Note 1
	NAVSEA 0900-LP-001-7000	Fabrication and Inspection of Brazed Piping Systems,		Note 1
	NAVSEA S6430-AE-TED-010	Technical Directive for Piping Devices, Flexible Hose Assemblies		Note 1
	NAVSEA S6430-AE-TED-020	Technical Directive for Piping Devices, Flexible Rubber Insert Sound Isolation Couplings (RISIC)		Note 1
	NAVSEA 0900-LP-029-9010	A Guide For The Selection And Use Of Aluminum Alloys For Structure Of Ships Of The United States Navy		Note 1
	NAVSEA S9AA0-AA-SPN-010/GEN-SPEC	General Specifications For Ships Of The United States Navy		Note 1
	NAVSHIPS 0900-038-8010	Ship Metallic Material Comparison and Use Guide		Note 1
	MIL-STD-22D	Weld Joint Design		Note 3
	CINCLANTFLTINST/CINCPAC FLTINST4790.3	Quality Maintenance (QA Manual) Joint Forces Maintenance Manual (JFMM)	Vol. 5	Note 4

**LEGEND:**

Note 1– To order, MILSTRIP to NAVICP PHILA (Stk No. from NAVSUP P2002) or via INTERNET <http://www.nll.navsup.navy.mil>

Note 2– INTERNET – <http://www.bupers.navy.mil>

Note 3– INTERNET – <http://dodssp.daps.mil/> or DOD Index of Specifications and Standards Part II (Use form DAPS Phila 1425E (10/98)

Note 4– INTERNET – <http://www.submepp.navy.mil/PRODSERV.HTM>